

What is claimed is:

1. An electrical power probe comprising:

a power probe control unit adapted to connect to a direct current (DC) power source and receive an input source voltage from the DC power source, said power probe control unit comprising power switching circuitry controlling the switching of the input source voltage to a cable; and

a power probe wand including a conductive wand tip and a user controlled switch device, said wand tip electrically connected to the power switching circuitry through the cable,

said power probe control unit adapted to send a query message to the power probe wand,

said power probe wand adapted to send a response to the power probe control unit in response to the query message, said response indicating the position of the user controlled switch device,

said power probe control unit adapted to selectably switch the power switching circuitry based on the position of the user controlled switch device.

2. The electrical power probe of claim 1 wherein:

said power probe control unit is adapted to connect to positive and negative input source voltages of the DC power source; and

said power switching circuitry controls the switching of either the positive input source voltage or the negative input source voltage to the cable.

3. The electrical power probe of claim 2 wherein said power probe control unit further comprises a positive input terminal adapted to connect to the positive input source voltage, a negative input terminal adapted to connect to the negative input source voltage, a reverse polarity protection fuse, and reverse polarity protection circuitry adapted to clear the reverse polarity protection fuse if the positive input terminal is connected to the negative input source voltage and the negative input terminal is connected to the positive input source voltage.

4. The electrical power probe of claim 2 wherein:

said user controlled switch device comprises first and second switches;

said query message requests the position of both the first and second switches; and

said response indicates the position of both the first and second switches.

5. The electrical power probe of claim 4 wherein:

said power probe control unit switches the power switching circuitry to connect the positive input source voltage to the conductive wand tip through cable if the first switch is in an activated state; and

said power probe control unit switches the power switching circuitry to connect the negative input source voltage to the conductive wand tip through cable if the second switch is in an activated state.

6. The electrical power probe of claim 5 wherein the power probe control unit is adapted to send commands to the power probe wand, and the power probe wand is adapted to send acknowledgements to the power probe control unit in response to the commands.

7. The electrical power probe of claim 6 wherein the cable comprises a first wire for carrying queries and commands transmitted to the power probe wand, a second wire for carrying responses transmitted to the power probe control unit, and a third wire electrically connecting the power switching circuitry with the conductive tip.

8. The electrical power probe of claim 7 wherein the power probe control unit further comprises a first microprocessor controlling operation of the power probe control unit, and the power probe wand comprises a second microprocessor controlling operation of the power probe wand.

9. The electrical power probe of claim 8 wherein, when the first and second wires are not being used for communication, the power probe control unit is adapted to hold the first wire and second wires a predetermined voltage potential apart to provide operating power to the microprocessor of the power probe wand.

10. The electrical power probe of claim 1 wherein the power switching circuitry comprises solid state devices.

11. The electrical power probe of claim 10 wherein each solid state device comprises at least one high current field effect transistor.

12. The electrical power probe of claim 1 wherein the power switching circuitry is electrically isolated from a load current delivered by wand tip.

13. The electrical power probe of claim 1 wherein:

said power probe control unit is adapted to connect to positive and negative input source voltages of the DC power source; and

when the input source voltage is not switched to the cable, the power probe control unit monitors voltage potential of the wand tip through the cable and determines if the voltage potential of the wand tip is substantially equal either the positive or negative input source voltages.

14. The electrical power probe of claim 13 wherein, if the power probe control unit determines the voltage potential of the wand tip is substantially equal to the positive input source voltage, the power probe control unit is adapted to transmit a first command to the power probe wand instructing the power probe wand to illuminate a first indicator.

15. The electrical power probe of claim 14 wherein, if the power probe control unit determines the voltage potential of the wand tip is substantially equal to the negative input source voltage, the power probe control unit is adapted to transmit a second command to the power probe wand instructing the power probe wand to illuminate a second indicator.

16. A method of operating an electrical power probe comprising:

providing a power probe control unit adapted to connect to a direct current (DC) power source and receive an input source voltage from the DC power source, said power probe control unit comprising power switching circuitry controlling the switching of the input source voltage to a cable;

providing a power probe wand including a conductive wand tip and a user controlled switch device, said wand tip electrically connected to the power switching circuitry through the cable;

sending a query message to the power probe wand from the power probe control unit, said query message instructing the power probe wand to report the state of the user controlled switch device;

sending a response message to the power probe control unit from the power probe wand, said response indicating the state of the user controlled switch device; and

switching, by the power probe control unit, the power switching circuitry based on the state of the user controlled switch.

17. The method of claim 16 wherein the power probe control unit comprises a positive input terminal and a negative input terminal, the user controlled switch device

comprises first and second switches, and the response message indicates the position of the first and second switches, the method further comprising:

- attaching the positive input terminal to a positive source voltage;
- attaching the negative input terminal to a negative source voltage;
- switching the positive source voltage to the cable if the first switch is activated;

and

- switching the negative source voltage to the cable if the second switch is activated.

18. The method of claim 17 wherein the power probe control unit comprises reverse polarity protection circuitry and a reverse polarity protection fuse, the method further comprising:

- clearing the reverse polarity protection fuse by the reverse polarity protection circuitry if the positive input terminal is attached to the negative source voltage and the negative input terminal is attached to the positive source voltage.

19. The method of claim 17 further comprising:

- sending a command message from the power probe control unit to the power probe wand.